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Ontario

Ministry of Training,
Colleges and Universities

MODULAR TRAINING STANDARDS

# *Basic Underground Hard Rock Miner – Common Core*

101-05730/

MODULAR TRAINING STANDARDS

# Basic Underground Hard Rock Miner – Common Core

## Program #770010

Revision date: January 2000
Printing date: June 2000

This document is the property of the apprentice named inside and represents the official record of his/her training.

Ministry of Training,
Colleges and Universities

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## TRAINING UNITS


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**Competency Analysis Profile**

## PREFACE

This training document was developed by the Program Development and Standards Unit of the Ministry of Training, Colleges and Universities, in consultation with representatives from the industry. These Training Standards are intended to be used by trainee, trainers/instructors and companies as a "blueprint" for training or as a prerequisite for government accreditation/certification. While this training document is intended as guidelines for training, all issues might not apply in all operations.

A Basic Underground Hard Rock Miner ( entry level) is a worker who has achieved accreditation in the entire Common Core Program # 770010. The Mining Tripartite Committee recommends that the employer must provide training in the entire common core for the Basic Underground Hard Rock Miner Training Program, to the worker, within the first year of employment. And, the appropriate common core modules related to a specialty module must be taken before training in the specialty module e.g Jumbo Drill. Employers have a responsibility to train workers for the work to be done e.g Mechanical Staging for a geologist.

The trainee will have completed the Common Core successfully only when he/she has demonstrated competency ( the level of skills prescribed) in each of the following modules:

- U0000 to U0002
- plus one of U0003, U003A, or U003B
- U0004, U0005, U0006
- plus one of U0008, U0009, or U0010

The first three modules, U0000 to U0002 are prerequisites to all other modules. They must be completed before any other modules can be done and before the employee can be permitted to work underground. Once these first three modules have been successfully completed, the order in which the other modules are trained is flexible and can vary.

New trainees or experienced miners must obtain accreditation in the same way. Each must demonstrate the skills specified in each Performance Objective to the described minimal acceptable standard as prescribed in each module. These demonstrations must be administered in an operating mine by a designated employee of the company who shall follow the Performance Demonstration Guidelines approved by the Mining Tripartite Committee.

The care and maintenance of this book is the joint responsibility of the trainee and the employer. The Training Standards were developed specifically for documenting the trainee's acquisition of skills.

Areas of the Basic Underground Hard Rock Common Core including mechanical staging, drilling, rock bolting, and mucking may infringe on some speciality modules for purposes of safety and technological changes. However, accreditation in these areas of the Common Core is not intended to replace accreditation in the speciality modules.

Throughout the document the term including is often used. Including means : one or more of the items listed, but not limited to those items included in the list.

**N.B.** Re: Lock out and /or tag, where it is practical or possible to lock, then locking and tagging should be the norm.

## IMPORTANT DIRECTIONS TO TRAINERS

Trainers instructing workers in this Common Core Program must themselves be accredited in the Basic Common Core Underground Hard Rock program #770010.

The Training Standards identify skills required for this occupation and its related training program.

These Training Standards have been written in concise statements which describe how well a trainee must perform each skill in order to become competent.

In using these Training Standards, trainers will be able to ensure that the trainee is developing skills detailed for the occupation.

Trainers and trainees are required to sign off and date the skills following each successful acquisition.

Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement in the space provided at the end of each unit.

## LISTING OF MINING PROGRAMS

- P770010 Common Core Basic Underground Hard Rock Miner
- P770010 Speciality Modules Program for Underground Hard Rock Mining
- P770120 Common Core First Line Production Supervisor - Underground Hard Rock Mining
- P810050 Common Core for Basic Mills Process Operations - Mineral Ore
- P810050 Speciality Modules Program for Mill Process Operators - Mineral Ore
- P770150 Underground Diamond Drilling
- P770200 Surface Diamond Drilling
- P770130 Common Core Underground Soft Rock Mining Skills
- P770130 Speciality Modules Program - Underground Soft Rock Mining

## UNDERGROUND HARD ROCK MINING SPECIALITY MODULES LISTING

### GROUP 1 PRODUCTION SPECIALITIES

| | |
|---|---|
| U0051 | Room and Pillar Mining-Non-Mechanized |
| U0052 | Room and Pillar Mining-Mechanized |
| U0053 | Shrinkage Mining |
| U0054 | Regular Cut and Fill Mining |
| U0055 | Mechanical Cut and Fill Mining |
| U0056 | Square Set Mining |
| U0057 | Under Cut and Fill Mining |
| U0058 | Bulk Mining-Non-Mechanized |
| U0059 | Bulk Mining-Mechanized |

### GROUP 2 DEVELOPMENT SPECIALITIES

| | |
|---|---|
| U0016 | Drifting-Non Mobile-Trackless |
| U0060 | Drifting-Mobile |
| U0061 | Drifting-Non Mobile-Track |
| U0062 | Raising Conventional Untimbered |
| U0063 | Raising Conventional-Timbered |
| U0064 | Raising Mechanized |
| U0065 | Drop Raising |
| U0066 | Shaft Sinking-Timber Lining |
| U0087 | Shaft Sinking-Concrete Lining |

### GROUP 3 HAULAGE SPECIALITIES

| | |
|---|---|
| U0017 | Scram Drift Operation |
| U0019 | Haulage-Track-Remote Control |
| U0020 | Haulage-Trackless-Operate Scoop Tram-Remote Control |
| U0023 | Operate Front-End Loader |
| U0067 | Haulage-Track |
| U0068 | Haulage-Trackless-Operate Scoop Tram |
| U0091 | Haulage-Trackless-Operate Haulage Truck |

### GROUP 4 SPECIALITY DRILLING AND BLASTING

| | |
|---|---|
| U0069 | Long Hole Drilling-Non Mechanized |
| U0070 | In-The-Hole Drilling |
| U0071 | Diamond Drilling |
| U0072 | Raise Borer |
| U0073 | Underground Rotary Drilling |
| U0089 | Operate Mechanized Jumbo Drill |
| U0090 | Long Hole Drilling-Mechanized |
| U0092 | Bulk Blasting-Mobile |
| U0093 | Bulk Blasting-Non-Mobile |

### GROUP 5 GENERAL SERVICES

| | |
|---|---|
| U0018 | Rock Bolting-Mechanized |
| U0021 | Operate Bulldozer |
| U0022 | Operate Grader |
| U0024 | Operate Utility Vehicle |
| U0025 | Muck Conditioner-Mechanized |

### GROUP 5 GENERAL SERVICES

| | |
|---|---|
| U0033 | Oxyacetylene Cutting |
| U0035 | Operate Backhoe |
| U0074 | Mine Hoist Operation-Friction Or Drum |
| U0075 | Track Installation and Maintenance |

**GROUP 5 GENERAL SERVICES** Cont'd

U0026 Cable Bolting-Mechanized
U0027 Cable Bolting-Non-Mechanized
U0028 Operate Scissor Lift Vehicle
U0029 Operate Rock Breaker
U0080 Pipe Installation and Maintenance
U0081 Tipple Operation
U0082 Ventilation-Installation and Maintenance
U0076 Fill Placement
U0077 Underground Crusher Operation
U0078 Underground Filter Operation
U0079 Conveying

**GROUP 6 SHAFT SERVICES**

U0083 Operate Cage
U0084 Shaft Maintenance
U0088 Operate Skip

**GROUP 7 CONSTRUCTION SERVICES**

U0085 Underground Construction
U0086 Shotcreting

## COMMITTEES

The Ministry is grateful for the co-operation and contribution of the following committees in the development and maintenance of the Common Core and Specialty Skills Modules Programs.

Training Review and Development Committee

**Labour**:

| | |
|---|---|
| Tony Amyotte** | United Steel Workers of America, Local 6500 |
| Mike Brimicombe | CAW/Mine, Mill and Smelter Workers' Union, Local 598 |
| Scott Emery | United Steel Workers of America, Local 7580 |
| Brian Landers | United Steel Workers of America, Local 6409 |
| Richard Lagrandeur | United Steel Workers of America, Local 6500 |
| Mike Wrice | United Steel Workers of America, Local 9165 |

**Management**:

| | |
|---|---|
| Art Welsh* | Falconbridge Limited |
| Bob Lefort | Williams Operating Corporation |
| John Lundrigan | INCO Limited |
| Bill Middleton | Boart Longyear Inc. |
| Mike Siemer | Falconbridge Limited |

Hard Rock Mining Tripartite Committee

**Labour**:

| | |
|---|---|
| Tony Amyotte** | United Steel Workers of America, Local 6500 |
| Len Bona, Co-Chair | United Steel Workers of America, Local 6500 |
| Mike Brimicombe | CAW/Mine, Mill and Smelter Workers' Union, Local 598 |
| Scott Emery | United Steel Workers of America, Local 7580 |
| Rick Grimard | CAW/Mine Mill and Smelter Workers' Union |
| Jim Kimt*** | United Steel Workers of America |
| Richard Lagrandeur | United Steel Workers of America, Local 6500 |

**Management**:

| | |
|---|---|
| Bill Middleton | Boart Longyear Inc. |
| John Chenier | Falconbridge Ltd. |
| Ron Rafuse, Co-Chair | INCO Ltd |
| Doug Turner | Kidd Creek Mines |
| Larry Watkinson | BLM Mining Services |

* Art Welsh was replaced by Mike Siemer.
** Tony Amyotte was replaced by Richard Lagrandeur.
*** Jim Kmit's alternate was Scott Emery.

**Resource:**

| | |
|---|---|
| Denis Beaudouin | Aurora Quarrying Limited |
| John Blogg | Ontario Mining Association |
| Bernie Deck | Ministry of Labour |
| Michelle Foster-Chandler | Ministry of Training, Colleges and Universities |
| Charlie Kennedy | Ministry of Labour |
| Lise Mackevicius | Ministry of Training, Colleges and Universities |
| Andy Piche | Ministry of Training, Colleges and Universities |

## IMPORTANT DIRECTIONS TO THE TRAINEE

Trainee

1. All hours working for each employer(s) must be recorded in the Employer Information section.

2. It is the responsibility of the trainee to inform the local Apprenticeship Client Services office regarding the following changes:

   - change of trainee name or address;
   - transfer to a new employer.

3. Training Reports must be signed for modular trainees by a Ministry of Training, Colleges and Universities designated Signing Authority and forwarded to a local Apprenticeship Client Services office.

4. At the completion of training, the Trainee Completion Form must be completed and signed off by the Signing Authority and submitted to local Apprenticeship Client Services office.

## NOTICE/DECLARATION FOR COLLECTION OF PERSONAL INFORMATION

1. This information is collected under the authority of the Order-In-Council Number 701/85.

2. The information is collected for the purpose of administering this modular training program within the Province of Ontario.

3. Questions regarding collection and use of this information may be directed to:

Director of Apprenticeship
Workplace Support Services Branch
Ministry of Training, Colleges and Universities
17th Floor, Mowat Block
900 Bay Street
Toronto, ON M7A 1L2
(416) 326-5605

## TRAINEE RECORD

Trainee Name: _____

Contract Number: _____
(If applicable)

## EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

Summary of Hours:

Dates of Employment: _____ _____
From To

Total hours of Training and Instruction between dates of Employment _____
Hours

| _____ | _____ | _____ | _____ |
|---|---|---|---|
| Employer Signature | Date | Trainee Signature | Date |

**EMPLOYER INFORMATION**

Company: _____

Address: _____

_____

Telephone: _____

Summary of Hours:

Dates of Employment: _____ _____
From To

Total hours of Training and Instruction between dates of Employment _____
Hours

| _____ | _____ | _____ | _____ |
|---|---|---|---|
| Employer Signature | Date | Trainee Signature | Date |

**EMPLOYER INFORMATION**

Company: _____

Address: _____

_____

Telephone: _____

Summary of Hours:

Dates of Employment: _____ _____
From To

Total hours of Training and Instruction between dates of Employment _____
Hours

| _____ | _____ | _____ | _____ |
|---|---|---|---|
| Employer Signature | Date | Trainee Signature | Date |

**EMPLOYER INFORMATION**

Company: _____

Address: _____

_____

Telephone: _____

Summary of Hours:

Dates of Employment: _____ From _____ To

Total hours of Training and Instruction between dates of Employment _____ Hours

_____ Employer Signature _____ Date _____ Trainee Signature _____ Date

**EMPLOYER INFORMATION**

Company: _____

Address: _____

_____

Telephone: _____

Summary of Hours:

Dates of Employment: _____ From _____ To

Total hours of Training and Instruction between dates of Employment _____ Hours

_____ Employer Signature _____ Date _____ Trainee Signature _____ Date

## TRAINEE COMPLETION FORM

Trainee Name _____
Print

_____
Signature

Social Insurance Number _____

Training Units when completed should be signed off by Trainer/ Signing Authority on the following page and presented with this completion form to your local Apprenticeship Client Services Office. Any supporting documentation should also be attached.

In-School completed: Yes ( ) No ( ) Not Applicable ( )
(proof to be provided)

Hours completed as
per Contract: Yes ( ) No ( ) Not Applicable ( )

Employer Name: _____

Address: _____

Telephone: _____

Signing Authority: _____
Signature

---

**MTCU USE ONLY:**

Recommended for Exam: Yes ( ) No ( ) Not Applicable ( )

_____ _____
Signature Consultant/Office Code

## TRAINING UNIT COMPLETION FORM

| TRAINING UNITS | TITLE | SIGNING AUTHORITY |
|---|---|---|
| U0000 | Follow Surface and Underground Induction Procedures | _____ |
| U0001 | Perform General Inspections | _____ |
| U0002 | Scale Loose Rock | _____ |
| U0003 | Set up Wooden Staging | _____ |
| U003A | Set up Pre-constructed Staging | _____ |
| U003B | Set up Mechanical Staging | _____ |
| U0004 | Drill Rock | _____ |
| U0005 | Rock Bolt Ground | _____ |
| U0006 | Blast Rock | _____ |
| U0007 | Muck using one of the following: | _____ |
| U0008 | Muck with Slusher | _____ |
| U0009 | Muck with Mucking Machine | _____ |
| U0010 | Muck with Load Haul Dump Machine | _____ |

## U0000 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES

### GENERAL PERFORMANCE OBJECTIVE

Follow surface and underground induction procedures, by identifying surface and underground areas; responding to emergencies; applying company policies, union contracts and joint health and safety policy; operating communication systems; identifying on-site explosive types and following related handling procedures; and reviewing multichannel radio use.

---

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

**SKILLS**

U0000.1 Identify surface areas, including: security, First Aid, Health and Safety Office, Hoist Room, Warehouse, Material Safety Data Sheets, Permit Stations, Engineering Offices, Union Office, Central Control Room, Accounting and Payroll, Supervisor Area, Occupational Health and Safety Act location, Wickets, Lamp Room, Tag In and Out Boards, and Stench Simulation Room, to ensure familiarity with surface layout according to company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0000.2 Identify underground areas, including: tramming/travel routes, ramp layouts, traffic controls, escape ways, man ways, shaft stations, substations, refuge stations, battery charging stations, ore and waste pass systems, back fill systems, cage call systems, central blast systems, communication systems, air, water and power rooms, lunch rooms, switch rooms, shops, fuel, wash and safety bays, garages, fire and ventilation doors, ventilation control boards, material storage, powder and cap magazine storage, tire storage, and specific work sites, to ensure familiarity with underground locations and systems according to company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0000 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES** - cont'd

U0000.3 Respond to surface and underground emergencies, including: fires by following procedures including: identifying escape ways, evacuation routes, fire doors, designated smoking areas and stench gas; reporting check in and check out, accidents, injuries and absences; wearing protective clothing and cap lamps; observing shift schedules and fire regulations; and following cage loading and conduct guidelines, to ensure the safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0000.4 Apply company policies, including: sexual harassment, discipline, written procedures, tagging in and out, working alone procedures; and locating manuals according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0000.5 Comply with union contracts and joint health and safety policy, by identifying union, worker and health and safety representatives; and indicating the location of their offices according to collective agreement, government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0000.6 Operate communication systems, including: pager phones, multi channel radios, cage call systems, telephones, fax machines, E-mail, inter plant mail, bulletin boards, safety signs, information boards and newsletters by identifying location; and operating to convey and obtain information according to company standards and manufacturer specifications.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0000 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES** - cont'd

U0000.7 Identify on-site explosive types, and follow related handling procedures, according to government legislation, company standards and manufacturer specifications.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0000.8 Review multichannel radio use, in the presence of explosives, according to government legislation, company standards and manufacturer specifications.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
|---|---|
| _____ | _____ |

## U0001 PERFORM GENERAL INSPECTIONS

### GENERAL PERFORMANCE OBJECTIVE

Perform General Inspections, by wearing, adjusting and maintaining personal protective equipment; erecting safety signs; operating fire extinguishers; maintaining ventilation flow; operating hand and power tools; locking out and/or tagging mobile and fixed equipment; performing emergency evacuation; identifying and reporting water in chutes and hang ups; and practicing good house keeping.

---

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0001.1 Wear, adjust and maintain personal protective equipment, including: eye, hand, foot, head, ear, lung, skin and body, and fall arrest system, to ensure optimum fit and protection to wearer for the task being performed according to government legislation, company standards, and manufacturer specifications.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0001.2 Erect safety signs, including: information, direction, cautionary, and danger by identifying hazards; and isolating area to prevent personal injury and inform employees of potential hazards according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0001.3 Operate fire extinguishers, including: A, B, C and ABC units, to control and/or put out fires including: paper, wood, trash, flammable liquids, lubricants, paints, and electrical according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0001 PERFORM GENERAL INSPECTIONS**- Cont'd

U0001.4 Maintain ventilation flow in operating underground mine, by inspecting air flow; identifying location of doors and barricades; adhering to instructions and markings posted on doors; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0001.5 Operate hand and power tools, including: axes, wrenches, picks, shovels, scaling bars, chainsaws, air tools and drills, so that tool selected is suitable for the job, in good condition, and has guards in place, so that no damage results to worker or tool according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0001.6 Lock out and/or tag mobile and fixed equipment, including: conveyors, chutes, loading pockets, crushers, scoop trams, load haul dump (LHD) machines and drill rigs, for repair and maintenance by shutting down the equipment; and reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0001.7 Perform emergency evacuation, by being aware of refuge stations, fire and emergency procedures, escape way locations, routes and markings to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0001 PERFORM GENERAL INSPECTIONS**- Cont'd

U0001.8 Identify and report water in chutes and hang ups, by performing visual inspection; reporting deficiencies; and performing repairs including: diverting water and/or shutting off water hoses according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0001.9 Practice good housekeeping in the workplace, by cleaning up spills and/or leaks; maintaining a clean work area free of obstructions; and storing tools and equipment to minimize accident or injury to self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
|---|---|
| _____ | _____ |

## U0002 SCALE LOOSE ROCK

### GENERAL PERFORMANCE OBJECTIVE

Scale loose rock, by identifying and responding to loose and abnormal ground conditions; identifying and responding to faulty ground support; identifying and responding to workplace hazards; inspecting and preparing the rock for scaling and scaling rock.

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0002.1 Identify and respond to loose and abnormal ground conditions, by washing down area including: faults, slips, dykes, rock noises, jointing and contacts; conducting visual and sounding inspections; sounding and scaling with scaling bar; isolating area and reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0002.2 Identify and respond to faulty ground support, by washing down area including: deformed plates, cracked cement, rock filled and/or broken screens, cracked timber, dry rot, bulging screen, spalling, and snapping/shredding bolts; conducting visual and sounding inspections; listening for rock noises; isolating area and reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0002.3 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0002 SCALE LOOSE ROCK** - Cont'd

U0002.4 Inspect and prepare rock for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; repairing and /or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0002.5 Scale rock, using scaling bar for specific job based on length, metal type, size and condition by reaching; prying; pulling; lifting; thrusting and sounding with bar to remove loose and to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
|---|---|
| _____ | _____ |

## U0003 SET UP WOODEN STAGING

### GENERAL PERFORMANCE OBJECTIVE

Set up wooden staging, by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; planning and organizing work site; constructing and erecting staging and ladders; and tearing down, moving and storing wooden staging.
NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0003.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0003.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0003.3 Plan and organize work site, by visually inspecting site; measuring area for required timber and materials including: eye bolts and ladders; selecting and delivering materials and timber to staging area; storing in preparation for staging; assembling power and hand tools including: axes, hammer, nails, saws, chains, stoper and jack leg according to company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0003 SET UP WOODEN STAGING** - Cont'd

U0003.4 Construct and erect wooden staging and ladders, by transporting selected timber to staging area; safeguarding open holes, man ways, low clearances, and mobile equipment; setting up warning signs, fall arrest systems, and guard rails; supporting staging using chains, muck pile and/or spraggs; and placing and attaching ladders to ensure free access according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0003.5 Tear down, move and store wooden staging, by removing and storing dismantled staging and equipment in preassigned area; using designated mobile equipment including: scoops, service vehicles, trucks, or manual means; repairing and /or reporting hazards including: protruding nails, loose rock, un-stored tools, hoses, pipes, open holes and mobile equipment; and storing planks, nails, chains, eye bolts, ladders and laggings according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
|---|---|
| _____ | _____ |

## U003A SET UP PRE-CONSTRUCTED STAGING

### GENERAL PERFORMANCE OBJECTIVE

Set up pre-constructed staging, by identifying and responding to work place hazards; inspecting and preparing workplace for scaling; performing equipment pre operational checks; placing and setting up staging; erecting standard ladders; tearing down and storing staging; and locking out and/or tagging mobile and fixed equipment. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

---

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U003A.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U003A.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0003A.3 Perform equipment pre-operational check on staging, by visually inspecting equipment; using 3 point contact while mounting and dismounting; locating components including: ladders, lagging, legs, chains, guard rails, anchors, and wings; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0003A SET UP PRE-CONSTRUCTED STAGING** - Cont'd

U0003A.4 Place and set up pre-constructed staging, by installing wings and guard rails as required; locating, securing, aligning, and spacing staging according to government legislation, company standards and manufacturer specifications.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0003A.5 Erect standard ladders, including: wooden and steel by securing for access, using chains and/or nails; and checking for deterioration according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0003A.6 Tear-down and store pre-constructed staging, by removing and storing hoses, pipes, materials and equipment; storing staging in designated area; folding wings and removing guards; correcting and/or reporting hazards including: protruding nails, poor housekeeping, and loose rock; and storing tools according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0003A.7 Lock-out and/or tag fixed equipment, including: conveyors, chutes, loading pockets, and crushers for repair and maintenance, by shutting down machine and process if required; ensuring no materials can enter equipment being repaired or maintained; tagging and/or reporting deficiencies; and barricading and/or erecting signs according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
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| _____ | _____ |

## U0003B SET UP MECHANICAL STAGING

### GENERAL PERFORMANCE OBJECTIVE

Set up mechanical staging, by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; performing pre operational checks; operating mechanical staging; and performing shut down on staging. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

0003B.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

0003B.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

0003B.3 Perform equipment pre-operational check on mechanical staging, by installing ladders and guard rails; using 3 point contact while mounting and dismounting; visually checking fluid levels and fire suppression systems; and maintaining housekeeping standards according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0003B SET UP MECHANICAL STAGING** - Cont'd

0003B.4 Operate mechanical staging, by checking and lowering jacks; placing and stabilizing guard rails; checking ventilation; and maintaining housekeeping standards according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0003B.5 Perform shut down on mechanical staging, by repairing and/or reporting potential hazards including: protruding nails, poor housekeeping, and loose rock; storing tools; removing and storing hoses, pipes, materials and equipment; cleaning and lowering platform; raising jacks; locking out and/or tagging equipment; and reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| | Employer's Name | Employer's Signature |
|---|---|---|
| | _____ | _____ |

## U0004 DRILL ROCK

### GENERAL PERFORMANCE OBJECTIVE

Drill rock, by identifying and responding to workplace hazards; inspecting and preparing rock for scaling; bleeding air and water lines; preparing face for drilling; setting up drills; performing pre operational checks on drills; maintaining drills; operating drills; and tearing down, moving and storing drills. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0004.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0004.2 Inspect and prepare rock face for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down area; selecting, repairing and fastening connecting hoses; setting water flow; identifying boot legs and misholes; taking corrective action; and/or reporting according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0004.3 Bleed air and water lines, by locking out and/or tagging pipes; flushing and installing headers using wrenches; fastening, securing, hanging and supporting pipe according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0004 DRILL ROCK** - Cont'd

U0004.4 Prepare face for drilling, including: drift, slash, bench and breast, by connecting water hoses; setting water pressure; blowing air line; locating, cleaning and marking misholes and bootlegs, using non-conductive materials, according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.5 Set-up drills, including: stopers, jacklegs and pluggers, with controls in the off position, by selecting /checking rock drill steel and bits; blowing air and water hoses to ensure unobstructed air and water flow; connecting lubricator to hoses; connecting hoses to drill; and filling lubricator using hand tools, including: various types of wrenches according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.6 Perform pre-operational check on stoper drill components, including: guards, steel retainers, foot spike, air and water controls, side rods and gooseneck, by positioning stoper and spike; advancing and retracting leg; rotating chuck; checking water flow; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.7 Perform pre-operational check on jackleg drill components, with controls in off position and air and water header open, including: machine air leg, leg to machine assembly, air, water and water tube controls, side rods, chuck, leg foot steel retainer, and leg control by positioning jack leg; rotating chuck; extending and retracting leg; checking water flow and steel retainer; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0004 DRILL ROCK** - Cont'd

U0004.8 Perform pre-operational check on plugger drill components, with controls in off position and air and water header open, including: air, water and water tube controls, side rods, chuck, steel retainer: checking handles and springs: rotating chuck; checking water flow; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.9 Maintain drills, by checking lubrication, hoses, controls, goosenecks, and general condition of drill; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.10 Operate drill, by collaring hole to pre-determined depth and pattern; checking lubrication, hoses, controls, ends and general condition of drill; repairing/reporting deficiencies; ensuring proper footing; identifying pinch points; and wearing personal protective equipment according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0004.11 Tear-down drill, by closing air and water lines; bleeding lines; moving and storing drilling equipment; performing post-operational checks; repairing and/or reporting deficiencies; and following housekeeping standards according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| | Employer's Name | Employer's Signature |
|---|---|---|
| | _____ | _____ |

## U0005 ROCK BOLT GROUND

### GENERAL PERFORMANCE OBJECTIVE

Rock bolt ground, by identifying and responding to workplace hazards; inspecting and preparing rock face for scaling; bleeding air and water lines; setting up drills; performing pre operational checks on drills; maintaining drills; operating drills; installing rock bolts; and tearing down and storing equipment. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0005.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0005.2 Inspect and prepare rock face for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; identifying boot legs and missed holes; and repairing and/or reporting according to government legislation company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0005.3 Bleed air and water lines, by locking out and/or tagging pipes; flushing and installing headers using wrenches; and fastening, securing, hanging and supporting pipe according to government legislation and company standards

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0005 ROCK BOLT GROUND** - Cont'd

U0005.4 Set up stoper and jackleg, with controls in the off position, by selecting rock drill steel and bits; blowing air and water hoses; connecting lubricators to hoses; connecting hoses to drill; and filling lubricator using hand tools including: crescent and pipe wrenches according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0005.5 Perform pre-operational check on stoper drill components, including: guards, foot spike, air and water controls, side rods and goose neck, by positioning stoper and spike; advancing and retracting leg; rotating chuck; checking water flow; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0005.6 Perform pre-operational check on jackleg drill components, with controls in off position and air and water header open, including: machine air leg, leg to machine assembly, air, water and water tube controls, side rods, chuck, leg foot steel retainer, and leg control by positioning jack leg; rotating chuck; extending and retracting leg; checking water flow and steel retainer; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0005.7 Maintain drill, by checking lubrication, hoses, controls, goosenecks and general condition of drill; and repairing and/or reporting deficiencies according government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0005 ROCK BOLT GROUND** - Cont'd

U0005.8 Operate drill, by collaring hole to pre-determined depth and pattern; checking lubrication, hoses, controls, general condition of drill; repairing/reporting deficiencies and wearing personal protective equipment according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0005.9 Install rock bolts, including: rebar, mechanical bolts, swellex and split sets using washers and mesh/screens, by determining required bolt, torque and dollie and installing according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0005.10 Tear-down and store drill, by closing air and water lines; bleeding lines; moving and storing drilling equipment; performing post-operational checks; repairing and/or reporting deficiencies; and following housekeeping standards according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| | Employer's Name | Employer's Signature |
|---|---|---|
| | _____ | _____ |

## U0006 BLAST ROCK

### GENERAL PERFORMANCE OBJECTIVE

Blast rock, by identifying and responding to work place hazards; inspecting and preparing workplace for scaling; selecting blasting detonators; transporting explosives and detonators; checking and cleaning block holes; selecting and operating explosive loading devices; loading hole; sandblasting oversize muck; re-blasting mishole; tearing down, moving and storing explosives and loading equipment; guarding area and preparing blast; and reporting blast. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0006.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes, housekeeping; isolating area; and reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0006.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down area; selecting, repairing, fastening and connecting hoses; setting water flow; identifying bootlegs and misholes; taking corrective action; and/or reporting according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0006 BLAST ROCK** - Cont'd

U0006.3 Select blasting detonators, including: electrical and tape fuse detonators from magazine, by determining type of blast including: oversize, hangup and misholes according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.4 Transport explosives and detonators, to work site in separate containers, using track/trackless transportation or manual means, by following safety procedures to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.5 Check and clean block holes, by flushing holes with water and /or air, using copper pipe, copper/aluminum scrapers, and anti-static plastics hoses, to ensure holes are clean according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.6 Select and operate explosive loading devices, including: anfo loader and loading sticks, by performing pre-operational checks; blowing hoses; hooking up air lines; installing anti-static hose; checking actuator valve, air valves and hoses to ensure obstruction free hoses; filling anfo loader with amount of anfo required for job; inserting hose and detonator to required depth; and depressing actuator valve according to government legislation, company standards, and manufacturer specifications.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0006 BLAST ROCK** - Cont'd

U0006.7 Load hole, by using stick powder; inserting both detonator and stick powder into hole; and tamping powder lightly using loading stick to secure according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.8 Sandblast oversize muck, by placing explosive charge on muck; inserting detonator in powder or connecting detonating cord and shock tubing to multiple locations according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.9 Reblast mishole, by shorting out blasting line; washing and scaling work area; washing/cleaning mishole with non-conductive material; and reloading and blasting according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.10 Tear down, move and store explosives and loading equipment, by disconnecting anfo loader from air lines; gathering unused explosives and materials; and returning to designated storage areas according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0006.11 Guard area and prepare blast, prior to hook up of blasting detonators, by notifying guards of blast location and time; placing/directing guards to designated waiting area; informing guards of exhaust gas routes; testing blast lines; hooking up blasting detonators and detonating cord; ensuring the person in charge of the blast initiates the blast; and releasing guards after blast according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0006** **BLAST ROCK** - Cont'd

U0006.12 Report blast, by documenting and reporting details including: location, time, amount of powder used and testing done according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |
| | Employer's Name | Employer's Signature |
| | _____ | _____ |

## U0008 MUCK WITH SLUSHER

### GENERAL PERFORMANCE OBJECTIVE

Muck with slusher, by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; performing pre-operational checks; setting-up and operating slusher; washing down work area; managing muck pile; shutting-down slusher; and handling explosives and disposing of foreign material. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0008.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0008.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0008 MUCK WITH SLUSHER** - Cont'd

U0008.3 Perform pre-operational check on slusher, by assembling and connecting components; attaching cables to drums; visually checking anchors; engaging and disengaging clutches; ensuring drums are free; checking and greasing rollers; inspecting guards and cables; checking fall arrest systems; posting warning signs; and installing blocks and anchors according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0008.4 Set up and operate slusher, by anchoring slusher using spraggs or bolts; connecting power source; installing anchors, blocks and cables; attaching slusher cables to scraper; turning on power supply; and manipulating clutches and brakes according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0008.5 Wash down work area, using water hoses, sprays and atomizers to control dust according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0008.6 Manage muck pile, by maneuvering scrapers in 2 and 3 drum set ups; removing foreign material including: rock bolts, screens, vent tubing, drill steel and explosives; barring muck; locking out and/or tagging equipment; and reporting deficiencies to prevent run of muck and hang ups according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0008 MUCK WITH SLUSHER** - Cont'd

U0008.7 Shut down slusher, by deactivating power source; storing cables and blocks; performing visual inspection; reporting deficiencies; and protecting equipment and components according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0008.8 Handle explosives and dispose of foreign material in muck pile, by returning unused and damaged explosives to magazines; and placing foreign material in scrap bins according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| Employer's Name | Employer's Signature |
|---|---|
| _____ | _____ |

## U0009 MUCK WITH MUCKING MACHINE

### GENERAL PERFORMANCE OBJECTIVE

Muck with mucking machine, by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; performing equipment pre- operational checks; setting up and operating mucking machine; washing down work area; managing muck plie; shutting down mucking machine; and handling explosives and disposing of foreign material. NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

### SKILLS

U0009.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0009.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0009 MUCK WITH MUCKING MACHINE** - Cont'd

U0009.3 Perform equipment pre-operational checks on mucking machine, by assembling and connecting components; checking connecting cables on bucket; inspecting centering pin, travel and swing controls, operator platform, whip check/chuck and bucket holding pin; repairing and/or reporting deficiencies; and posting warning signs according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0009.4 Set up and operate mucking machine, by installing air hoses and safety chains; turning on air; engaging clutch and installing stand; removing centering and bucket pins as applicable; raising and lowering bucket; ensuring track is secure; using proper track gauge and side rail; checking overhead clearance; coupling to motor as required; connecting to power source; steering and traveling as required; and re railing machine using re railers, re rail bars or chain blocks according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0009.5 Wash down work area, using water hoses, sprays and atomizers to control dust according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0009.6 Manage muck pile, by removing foreign material including: rock bolts, screens, vent tubing, drill steel and explosives, while mucking from side to side according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0009 MUCK WITH MUCKING MACHINE** - Cont'd

U0009.7 Shut down mucking machine, by performing visual inspection and reporting deficiencies; securing bucket and stand; positioning machine; disengaging clutch; shutting off and bleeding air line prior to disconnecting air; and protecting equipment and components according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0009.8 Handle explosives and dispose of foreign material in muck pile, by returning unused and damaged explosives to magazines; and placing foreign material in scrap bins according to government legislation and company.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

| | Employer's Name | Employer's Signature |
|---|---|---|
| | _____ | _____ |

## U0010 MUCK WITH LOAD HAUL DUMP MACHINE

### GENERAL PERFORMANCE OBJECTIVE

Muck with load haul dump (LHD) machine, by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; performing equipment pre-operational checks; setting up and operating LHD machine; conducting operational checks; loading, hauling and dumping muck; and parking and shutting down LHD machine.
NOTE: Review the Perform General Inspections and Scale Loose Modules, U0001 and U0002.

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### PERFORMANCE OBJECTIVES

Trainer's Name (Print) _____ Trainee's Name (Print) _____

**SKILLS**

U0010.1 Identify and respond to workplace hazards, including: ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating area; and repairing and/or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

U0010.2 Inspect and prepare workplace for scaling, by selecting scaling bar for specific job based on length, metal type, size and condition; washing down face; selecting, repairing and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies according to government legislation and company standards.

Date Completed _____ Trainer's Signature _____ Trainee's Signature _____

**U0010 MUCK WITH LOAD HAUL DUMP MACHINE** - Cont'd

U0010.3 Perform equipment pre-operational check on load haul dump (LHD) machine, by testing power source; checking fluid levels; following refuelling and lubricating procedures; locating principle components, including: chassis, body, engine/power source, power train, controls, bucket, wheel assembly, trailing cable, lighting and warning systems; performing visual inspection of fire extinguishers and fire suppression systems; positioning pins and nozzles; inspecting tires, wheels and wheel nut assemblies; inspecting braking system and chassis; locking out and/or tagging machine; using 3 point contact while mounting and dismounting; and repairing and/or reporting deficiencies according to, government legislation, company standards and manufacturer specifications .

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0010.4 Set-up and operate LHD machine, including: air and electric powered scoop trams, by installing air hoses; turning on power; obeying speed limits, traffic signs and regulations; selecting gears for ramps; noting direction of ventilation flow and position of ventilation/fire doors; repairing and/or reporting deficiencies; observing equipment operation and load limits; and checking clearance and activity in area to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0010.5 Conduct operational checks on LHD machine, by monitoring gauges and meters including: oil and air pressure, temperature, alternator output, transmission and torque pressure; listening for unusual noises in engine/power train; inspecting steering and brakes; locking out and/or tagging; and repairing and/or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

**U0010 MUCK WITH LOAD HAUL DUMP MACHINE** - Cont'd

U0010.6 Load muck, using bucket within its limitations, by ensuring bucket clearance and clear machine path; handling explosives and disposing of foreign material; maintaining muck piles; repairing and/or reporting ventilation deficiencies; and spraying muck piles according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0010.7 Haul muck, with bucket secured, by ensuring bucket clearance and clear machine path; complying with speed limits, traffic signs and signals; repairing and/or reporting ventilation deficiencies; maintaining road ways and dump areas; and noting direction of the ventilation flow and position of ventilation/ fire doors to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0010.8 Dump muck, by positioning vehicle at dump site; ensuring stable ground conditions; installing fall arrest system; and inspecting bumper block and /or dump walls to ensure safety of self and others according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |

U0010.9 Park and shut down LHD machine, by positioning vehicle to face wall in designated area; lowering bucket to ground; setting park brake and wheel chocks; protecting equipment; completing operator's report; and repairing and /or reporting deficiencies according to government legislation and company standards.

| Date Completed | Trainer's Signature | Trainee's Signature |
|---|---|---|
| _____ | _____ | _____ |
| | Employer's Name | Employer's Signature |
| | _____ | _____ |

## Glossary of Mining Terms

| | |
|---|---|
| AIR BAG: | An Inflatable rubber, balloon-like device that can be used to lift heavy objects. |
| AIR BLAST: | A wave or rush of air that results when there is an underground explosion or a collapse of rock. |
| AIRLIFT: | A pump that moves water when air is forced into the pump's chamber. (Compressed air is introduced into the discharge pipe, and as the water and air rise, the air expands until it is almost at atmospheric pressure.) |
| ANCHOR RAIL: | 1. A rail to which ore cars are attached prior to dumping in order to prevent them form tipping.<br>2. A rail buried in fill to anchor a slusher.<br>3. A rail holding down stationary equipment.<br>4. An alimak rail. |
| ANFO: | A blasting agent made up of ammonium nitrate and fuel oil. |
| ARCH or ARCHING: | The rock structure left at the intersection of the walls and back to help support the back. (Curved back formations might result naturally due to the caving of the rock or might be designed as a circular or elliptical support.) |
| AUXILIARY VENTILATION: | Mechanical ventilation system used to deliver air into a workplace off the main air stream e.g into a dead end heading. Ventilation that is generated by auxiliary fans. |
| BACK | The roof, ceiling or upper part of any underground excavation or cavity. |
| BACK BLOCKING: | A method of holding mine timber sets in place or blocking to support the back. |
| BACKFILL: | Waste rock, cement, gravel, sand or tailings used to refill and provide support to an excavation or stope following the removal of ore. |
| BALANCED HOISTING: | A conventional system of hoisting cages or skips from one horizon to another. When one cage or skip goes up, another cage or skip goes down. |

| | |
|---|---|
| BALLAST: | Broken rock, sand or other heavy material that provides a solid, stable base for railway ties. |
| BARRICADE : | A closure/restriction to any mine opening. |
| BARRING: | Rearranging or moving out broken muck using a suitable bar. |
| BASE METALS: | Common non-precious metals, such as zinc, iron, copper, nickel or lead. |
| BASE OF RAIL: | The bottom elevation of a drift. |
| BEARERS or BEARING SETS: | Heavy lengths of square-set timber or steel placed in mine opening to stabilize or support the surrounding rock. |
| BEAT: | A portion or area of mine under the supervision of a specific individual e.g an area being managed or supervised by a shift boss. |
| BED: | A cushion of broken muck or rock ballast. |
| BEDDING: | Flat lying seams occurring among stratified rock and parallel to the stratification. |
| BELL/CORD: | The line attached to a signaling device, used to send signals for the operation of the shaft conveyance or tugger hoist. |
| BENCH: | A horizontal ledge or step ( sometimes called a seam) which forms a single level of operation. Also a section of rock that has open faces on top and on one or more sides. |
| BERM: | A ridge or ledge that might be used as along a haulage way to prevent inadvertent entry. |
| BIN: | A box or container used for storing tools, ore, rock or other items. |
| BIT: | The cutting edge, usually chisel shaped, of drill steel. The bit may be part of the drill steel or a detachable portion of the drill steel. The bit breaks or crushes the rock as the drill steel rotates. Bits are usually made of ultra-hard materials, such as tungsten-carbide or diamonds. |
| BLAST or BLASTING: | To use explosives or blasting agents to break rock or other material. |

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| BLASTING AGENT: | An explosive material designed to be used in the blasting process. |
| BLAST HOLE: | A drilled hole the explosive charge or blasting agent is placed in. |
| BLOCK: | A mass section or area of ore exposed by underground workings. Also refers to a pulley. |
| BLOCKING OUT: | The process of exposing an ore body by systematic core drilling or by developing openings on a minimum of three sides. |
| BLOCK HOLING: | Drilling large boulders and blasting them with small charges. |
| BLOW OUT : | Failure of a shot or blast to break the rock. Also referred to as a blowout shot. |
| BLOWING OUT: | Cleaning out a drilled hole using a blow pipe usually in preparation for blasting. |
| BOGIE: | 1. The forward half of a center articulated mobile equipment.<br>5. A rail-truck used to move material. |
| BOOTLEG: | Bottom portion of a remnant of a blasted hole. |
| BOOM: | Physical extension to a piece of equipment. |
| BOOMING OUT: | Positioning machinery booms e.g Jumbo Booms\timbering out. |
| BRATTICE: | 1. Wall of cloth , plank, steel or concrete block lining commonly used for ventilation.<br>2. Material used to divide vertical sections in compartments of a shaft. |
| BREAK: | The effect or result of an underground blast. A *good break* describes well-broken ground. |
| BREAST: | A face or heading that is being undercut. |
| BREAKTHROUGH: | A drift being developed that breaks into an existing opening. |
| BUDDY: | A work partner. In metal mines, partner is more commonly used than buddy. |

BUGGY: A small wagon, car or truck used to transport heavy materials over short distances.

BULKHEAD: A structure for the impoundment of water, compressed air, hydraulic backfill or any material in an underground opening where the potential pressure against the structure will be in excess of 100 kilopascals.

BULK SAMPLE: A large representative sample that has been taken from many tons of material.

BOREHOLE: Any large diameter bored hole.

BOXHOLE: Boxhole is a term used to describe short passages and ore pass is used to label a passage that connects two levels. A drawpoint is the spot where gravity fed ore is loaded into hauling units.

BULLHORN: A large steel pin shaped like a bull's horn that is placed in a drilled hole and used for hanging equipment or securing timber.

BULLHOSE: A large air hose used when air operated equipment needs a large volume of air.

BURDEN: The measured space between a blasthole and the nearest open face, or the perpendicular distance between blast holes that, as the explosives are initiated, will become open faces. Sometimes the burden refers to the cubic measure or tons of material to be blasted.

BURLAP: A strong, tightly woven jute, hemp or cotton material used for straining tailings. The particles will remain and the liquids escape. For underground use, a plastic material has replaced burlap.

BURN or SHATTER CUTS: A parallel pattern of drill-holes, usually 6" to 12" deep, used to develop a free face. One or more of the holes remain uncharged. Some of the uncharged holes are reamed to a larger diameter.

CABLE BOLTING: A method of reinforcing by cementing stranded cable in a drillhole.

CABLE LACING: A method of reinforcing rockburst prone areas by placing cable over screen. In the event of a rockburst, the cables will reinforce the existing support system.

CACHE: An underground location where supplies are hidden or stored.

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| CAGE: | A box-like enclosure used in a mine shaft to transport or convey men and materials to and from various working levels. |
| CAGE GUIDES: | Fixed timber runners, fixed steel-tube runners, or wire rope used to track or guide a cage as it moves up or down a mine shaft. |
| CANOPY/HOOD: | 1. A protective covering above the conveyance for protection of workers.<br>2. A covering on equipment to protect workers and equipment. |
| CAPS: | Load-bearing horizontal plank or timber used in a two or three-member timber set. Also a small cylinder which contains a detonating mixture and is linked to a fuse or electric current. Also see detonators. |
| CAPTAIN /MINE CAPTAIN: | A line of management. |
| CAR OR MINE CAR: | A wheeled carriage used to transport cargo or broken rock. |
| CASING: | Tubing inserted into a drillhole to make the hole more stable. |
| CATCH PIT/FENCE: | A construction of wood and filter material used to drain water and containing slimes and sand spillage from a fill pour. In shaft sinking, also known as a CATCH BASIN. |
| CAVE OR CAVE-IN: | The partial or complete collapse or failure of walls, backs or rock pillars. A cave-in can be caused by the pressure exerted by the surrounding mass of rock. |
| CAVING: | A mining method that involves breaking the ore by inducing a cave-in. There are variations of caving, including block caving, sub-level caving, top slicing, longwall, and room and pillar. |
| CENTRALIZER: | A device used to line up a drill steel when collaring or starting drill holes. |
| CEMENTED ROCKFILL: | A combination of broken rock and cement that is used to backfill underground openings. The fill supports the walls of the opening or provides a working floor. |

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| CEMENTED TAILINGS FILL: | A combination of finely ground waste rock and cement that is used to backfill underground openings. The fill supports the walls of the opening or provides a working floor. |
| CHAIR(s): | Movable supports used for the cage or used to support the cage at the correct elevation. |
| CHANGE HOUSE: | A mine building mining personnel use to change into and out of their working clothes. Also called a 'dry'. |
| CHARGE: | 1. An explosive and a detonator, or<br>2. An explosive, a detonator and a primer that is exploded as a single unit. |
| CHARGING STATION | An underground room or chamber used specifically for charging and exchanging locomotive batteries. Also called a charging room. |
| CRIB: | A square or rectangular pillar constructed of timbers that have been laid in alternate cross layers; A crib is created to support the back. The centre of the pillar might be filled with waste or rock. |
| CHUTE/MILLHOLE/ ORE PASS: | A steeply inclined passage used to move ore from one elevation to a lower elevation. The term chute is used to identify the ore passage and the control position situated at the bottom of the passage. The term millhole is used to define the constructed portion of the passage above the headblock (timber or steel across the chute opening.) |
| CHUTE: | A device used to direct/control the flow of material elevation. |
| CLAIM: | An area or portion of land a person has defined by stakes. To hold mineral rights for the claim it must be reported to the appropriate government office. |
| CLAM: | Mechanical equipment used for mucking in shaft sinking operations. |
| CLEAT: | A piece of wood nailed to a timber or other structure intended as support. |
| COLLAR: | 1. The timbering or concrete around the shaft.<br>2. The start of a drill hole. |

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| COLLARING: | 1. The process of beginning the drilling of a hole.<br>2. The process of beginning an excavation of a mine shaft. |
| COME-A-LONG: | A hand operated ratchet block lifting device. |
| COMPARTMENT: | A shaft division formed by dividers. |
| CONCURRENT BACKFILLING: | Placing backfill into an underground opening immediately after the ore or rock has been moved. |
| CONVEYOR BELT: | A mechanical device, usually electrically driven belt, which extends from a receiving point to a discharge point and conveys material between those two points. |
| CORE: | Cylindrical shaped section of minerals or rock that have been extracted or recovered by diamond drilling. A core reveals the various strata of the area. |
| CORE BOXES: | Lidded containers designed to hold core in parallel grooves. |
| CROSSCUT: | A horizontal underground tunnel driven perpendicular or at an angle to the strike. Also called a travel way. |
| CROSSHEAD: | A guiding device that prevents a bucket from swaying as it is being lowered into a shaft. |
| CROWN PILLAR: | A horizontal plug or neck of rock left above a mined out area for support. |
| CRUSHER: | A machine used to reduce the size of ore/waste by crushing. |
| CUT: | A term used to describe the location and direction of holes that are blasted in order to provide a free face to which other holes are blasted. A cut is also a slice or lift taken during stoping operations. |
| CUTOFF or CUTOFF HOLE: | A portion of a charged hole that has been broken or isolated as the result of ground movement. |
| DEADMAN: | A buried log, concrete structure, or object that functions as an anchor. A deadman is also a block used on an incline to guard against runaway cars. |

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| DECANTATION: | The separation of a liquid from sediment by taking the liquid out without disturbing the sediment. |
| DECK: | One of the separate platforms or divisions of a cage. Also, sometimes the top level of the shaft is called the deck. |
| DELAY DETONATOR: | A detonation device that initiates a delayed explosion after a predetermined period of time. |
| DETONATE: | To cause an explosive agent or mixture to explode. |
| DETONATOR: | A device used in firing a charge of explosive and includes blasting cap and electric blasting cap. |
| DEVELOPMENT: | The initial work required to open up or access a mineral deposit, including sinking a shaft and creating drifts, crosscuts and raises. |
| DIAMOND CUT/ PYRAMID CUT: | A converging pattern of drill holes expected to break a pyramid-shaped volume of rock. |
| DIAMOND DRILL: | A rotary type of rock drill using diamond cutting bit. |
| DIP: | The angle at which a vein, structure or rock bed is inclined from the horizontal and is measured at right angles to the strike. |
| DISKING: | A condition of a drill core sample that indicates an area is under high stress. When the rock sample contains many thin slices or disks, the area is under considerable stress. |
| DISPLACEMENT: | A term referring to changes from one side of a fracture plane relative to the other side of the plane. |
| DIVIDERS: | Cross-steel or timber members in a shaft that divide it into compartments and which may support brattice, guides, etc.. |
| DOGS: | Mechanical safety devices, used in shaft conveyances, that automatically grab the guides in the shaft in case of rope failure. |
| DOLLIE: | A drill attachment used for the installation of ground control systems e.g rock bolt, rebar, split set and swellex. |

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| DOWNCAST: | The movement of air downward in a mine. |
| DRAW POINT: | A funnel-shaped opening at the bottom of a stope. |
| DRIFT: | A horizontal underground opening originally parallel to the strike of an ore body . |
| DRILL (noun): | Any cutting tool which uses energy to produce a circular hole in rock, metal, wood, or other materials. |
| DRILL AUGER: | A drill rod, with an external spiral, which expels cuttings from grill hole. |
| DRILL BIT: | One of a number of cutting tools used to cut circular holes in rock, wood, metal. |
| DRILL HOLE: | A drilled hole in which rock bolts, explosives charges or blasting agents are placed. Also referred to as a blast hole. |
| DRILL STRING: | The assemblage in a drill hole, consisting of drill rods, core barrel and bit or drill rods and bit, which is connected to and rotated by the drill at the collar of the bore hole. |
| DRIVE/DRIVING: | The process of excavating underground passages. In some mining communities the terms are reserved for the creating of horizontal passages. |
| DRUM HOIST: | A large, power-driven cylinder or cone on which a rope is coiled to hoist and lower materials and/or personnel. |
| DRUMMY: | A scaling term describing the sound that is emitted when loose rock is struck by a steel bar or hammer. The muffled sound is similar to that of a drum being struck. |
| DYKE: | A long, relatively thin body of igneous rock. |
| EASERS/EASER HOLES: | Holes drilled to lighten the burden in a drill pattern also referred to as helper holes. |
| ELECTRO-MAGNETIC TEST: | Test using electromagnetic equipment to determine the condition of mine hoist ropes and to identify and locate problems. |

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| EMERGENCY PULL CORD: | A rope or line by which a machine or conveyor can be stopped from a remote location. |
| END PLATES: | Horizontal shaft timber components, normally the shortest member in a rectangular shaft. |
| ESCAPE WAY/ EMERGENCY MANWAY: | An opening through which persons may leave the mine or workplace if the normal exit is obstructed. |
| EXPLORE: | To prospect or search for ore. |
| EXPLOSIVES: | A substance that is made, manufactured or used to produce an explosion or detonation and includes gunpowder, propellant powder, dynamite, detonating cord, blasting agent, slurry, water gel and detonator. |
| EYEBOLT: | A rod or bolt having a looped or ring-shaped opening at one end. |
| FACE: | Any part of mine where rock is being worked, such as a drift, crosscut, or stope. In a stope the face is commonly called the breast if the holes are being drilled horizontally. Most commonly, the end of a drift or stope where work is being carried out is called the face. |
| FAILURE ZONE: | The area or portion of rock, around an opening, that is subject to collapse or movement. |
| FALL ARREST SYSTEM: | A suitable combination of a belt a full body harness, a lanyard, an anchor and a rope grabbing device or life line |
| FALL OF GROUND: | Rock that falls from the roof or wall as a result of gravity. |
| FAULTS: | A fracture or fracture zone along which there has been a clearly visible dislocation or displacement of the two sides, relative to one another. |
| FAULTING: | The moving or shifting that results in the displacement of adjacent rock masses along a break or fracture. |
| FINE(S): | Tiny particles of crushed rock or ore that are smaller than a specified screen size. |

FIRE HAZARD AREA:
1. An area where a fire hazard may be created by smoking, matches or other means of producing heat or fire and which has been designated as such by the supervisor in charge of the mine, or
2. A storage area where oil, grease or flammable liquids are stored in excess of 500 litres.

FIRE SUPPRESSION SYSTEM: An installation for the specific purpose of controlling a fire in a particular place or piece of equipment.

FIRING: The act of detonating an explosive charge.

FISH PLATES: Specially shaped steel plates used to join the end of one rail to the next in the track.

FLOOR: The level working area in a stope, or the flat underlying layer of ore. When the foot wall is the floor, the hard surface in the flat-lying seams is also considered to be the floor.

FOLDING: The bending of rock strata that results in geologic structures such as anticlines, synclines, monoclines and isoclines.

FOOTWALL: The lower wall of any mine opening.

FRACTURE: A clean break or crack in ore or rock.

FRACTURE ZONE: A mass or area of rock that has many small, irregular fractures.

FRAGMENTATION: The process of blasting ore or rock into pieces that are small enough to be easily handled or moved.

FREE FACE: An open side or area of rock which a charged hole can break.

FRICTION HOIST (KOEPE): A mine hoist in which conveyances are suspended from both sides of a simple friction pulley which imparts a desired motion. It is distinct from a drum hoist in which case the ropes are wound on individual drums.

FROG: The centrepiece of a track switch.

FROZEN CUT: The first holes blasted in a development round that do not break the rock as intended but shatter and cover over with no explosives visible.

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| SAFETY FUSE: | A prepared cord, made of combustible materials, used to ignite a detonator or an explosive charge. |
| GAD: | An iron or steel wedge-shaped tool used to break loose rock or ore that is difficult to scale down. |
| GALVANOMETER: | An instrument used to detect small electric current. In electric blasting it is used to determine if there are broken wires or short circuits |
| GANGWAY: | An elevated travel way in a drift, usually of timber construction, used to provide access to pull chutes. |
| GAUGE RODS: | A device for stabilizing the distance between the rails. |
| GRIZZLY: | A series of bars, rails or other members used to control the size of material passing into an ore/waste pass. |
| GROUND FAULT SYSTEM: | A sensing device used in electrical circuits that interrupts the power supply when electrical current leaks to ground. |
| GROUNDING CHAIN: | A sensing device used on rubber tired vehicles to ground shorts and static electricity. |
| GUARD: | 1. A fixture or attachment used to guard against injury.<br>3. A person placed to prevent access to a blast. |
| HANGING RODS: | Fabricated metal rods used to hang the components of shaft timber (dividers, wall and end plates )and timber in place. |
| HEADBLOCK: | A length of timber or steel forming the top part of a chute opening. |
| HEADER: | A large pipe or chamber with several tees or nozzles connected to consuming points (or areas where either water or air is required). A header maintains water pressure and allows water to advance as required. |
| HEADFRAME: | An arrangement of control valves at the end of a pipe. The steel, timber or concrete frame that supports the hoisting sheaves (grooved or groove-rimmed wheels) over the mine shaft. |
| HEADING: | Work place in an underground mine. |

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| HITCH: | A notch, step or hole cut in a rock in order to support or hold timber or steel posts, beams, or stalls. |
| HOIST (verb): | To raise or lower materials or personnel. |
| HOOD: | A removable, protective cover used over conveyances for shaft inspection. |
| HUNG LOAD: | Any load of materials that is suspended. |
| HYDRAULIC BACKFILL: | Waste material that has been both transported and flushed into place through the use of water. |
| IGNITER CORD: | A small-diameter cord made of combustible material and used to ignite a safety fuse or a series of safety fuses. The igniter cord is designed so that its flame burns at an even rate. |
| JACK-LEG: | A hand held, pneumatic, percussion drill with a hand controlled pneumatic extension leg. |
| JIM CROW: | A portable tool used to bend iron rails. |
| JOINTS: | Rock fractures that run parallel to a plane or surface and that show little or no visible movement or displacement. |
| JUMBO OR JUMBO DRILL: | A drill carriage on tracks, rails or tires and with one or more booms or arms which support the drilling machinery. |
| LAGGING: | 1. Timber placed under the roof of a stope or drift to catch small pieces of rock rather than support the main weight of overlying rocks.<br>2. Round timber in various sizes and lengths used underground for staging. |
| LEACH OR LEACHING: | The natural process of dissolving minerals from rock or ore by draining liquids downward or allowing them to percolate. Also, LEACHING is a chemical process used to extract valuable minerals from ore. |
| LEVEL: | A horizontal or nearly horizontal plane of interconnected mining areas. |

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| LIFELINE(S): | The part in a fall arrest system that runs from the anchor to the personal safety belt or body harness. |
| LIFTERS: | Bottom holes in a drift round/raise round slash. |
| LOADING POCKET: | An excavated storage area in the shaft where rock is transferred from o.p./w.p. to skip conveyances. |
| LOAD HAUL DUMP (LHD): | A machine powered by electricity, diesel or compressed air which loads, hauls, and dumps ore. |
| LOCKOUT AND/OR TAGGING | Safety procedures device used to prevent the activating or energizing of equipment. |
| LOOSE ROCK: | Fragmented or weak rock that needs to be taken down. Also referred to as LOOSE. |
| LUX: | A unit of measurement by which light intensity is measured. |
| MAN WAY: | Any passage normally used for travel from one elevation to another. |
| MAGAZINE: | On surface, a specially constructed room or building used for the storage of explosives. Underground, a specially prepared and designated area for storing explosives. |
| MECHANICAL SCALER: | A machine used to remove loose from an opening, usually by a hammering process. |
| MICROSEISMIC MONITORING: | Using an electronic device to measure subaudible stress noises or changes which occur in the rock. The readings taken by a MICROSEISMIC MONITOR can be used as indicators of rock failure. |
| MILL HOLE: | An opening for the passage of muck. |
| MISHOLE: | A drill hole that contains explosives in which all or part of the explosives has failed to detonate. |

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| MUCK (noun): | Rock that has been broken by blasting. |
| MUCK (verb): | To shovel or load any material. |
| NIPPING: | Movement of material. |
| OLD CUTS: | The remnant of a blasted cut. |
| OPEN HOLE: | Any unprotected hole through which a person could fall or enter. |
| OPEN STOPING: | OPEN STOPING involves the removal of the entire ore body without leaving any pillars. |
| OPERATING MINE: | An underground hard rock mine where production, development and changing conditions require maintenance and installation of infrastructure, ground control and ventilation for the extraction of ore. It is where a worker can demonstrate terminal performance objectives as outlined in a specific module. |
| ORE: | Mixtures of minerals and waste rock from which at least one mineral can be mined for profit. |
| ORE PASS: | An opening to accommodate the movement of broken muck. |
| OVERBREAK: | When rock breaks past the design of the blast. |
| OVERWIND: | The act of hoisting (or winding up) a cage or skip beyond its safe limits. |
| PANELS: | A group of working places, usually operated as a unit, separated by large pillars. |
| PERCOLATION: | The process of allowing a liquid to seep through a solid. |
| PILOT HOLE: | A small diameter hole used to guide or direct a reamer. |
| PIN SETS: | The base of a structure formed by drilling pin holes in the wall and installing steel pins which support a saddle block for the support of base timbers on beams. |
| PILLAR: | The engineered support at any opening being excavated in a mine. |
| PINCH POINTS: | Any point on a machine or piece of equipment where movement may cause pinching. |

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| POLE BLASTING: | Blasting a box hole or chute using a charge tied to a pole. |
| PONY SET: | A small timber set incorporated into the main timber set as additional reinforcement. |
| POPPING: | The snapping noise heard in the vicinity of recently blasted openings or in highly stressed areas. POPPING sometimes referred to as SPALLING. |
| PORTAL: | The surface opening to a shaft, tunnel or adit. |
| POST: | A timber placed in an upright position and used as a support prop. |
| POST PILLARS: | Very slender pillars used in conjunction with backfill to support the rock. |
| POWDER: | An often-used term for explosives or blasting agents. |
| PREMATURE BLAST: | The detonation of an explosive charge earlier than planned. Also referred to as premature firing. |
| PRIMER: | A small charge placed within the main charge to initiate an explosion. |
| RAISE: | A vertical or inclined underground opening. |
| RAMP: | An inclined roadway. |
| REAM: | To enlarge a drill hole by re-drilling with a special bit. |
| REFUGE STATION: | An underground area that can be sealed off and used by miners as a refuge against fires and their effects. See regulation 26 of the Occupational Health and Safety Act. |
| RESIN BOLTING: | A method of roof bolting that involves anchoring the bolt in resin. |
| ROCK BOLTING: | A manual or mechanized method of securing the back, roof and walls. |
| ROCKBURST: | A sudden failure of rock. |
| ROCK MECHANICS: | The study and mathematical analysis of the behaviour of rock, focusing on the forces that affect rock along planes and faults and around excavations. |

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| ROOM and PILLAR: | A mining method that involves excavating rooms and leaving pillars. This method is often used when the ore is present in a flat seam. |
| ROTARY DRILL: | A drill which bores or cuts a hole as the drill bit rotates. |
| ROTARY PERCUSSION DRILL: | A drill which repeatedly strikes the rock surface as it is boring or cutting a hole. |
| ROUND: | A drill pattern drilled and charged to a predetermined depth to excavate. |
| RUN LIGHT: | A light which indicates the operational status of equipment. |
| SAFETY BAY (STATION): | An enlargement in a haulage drift for the safety of people when haulage equipment is being met. |
| SAND BLASTING: | Blasting chunks using a charge set on top of a rock to reduce the size. |
| SCALING: | Checking, conditioning, removing loose rock from roofs, walls and faces. |
| SCALING BAR: | A shaft or rod ( with a forged or replaceable tip) that is used to pry loose rock from the face, back and walls. |
| SCRAPER: | Used in conjunction with a slusher to move broken rock. |
| SCRUBBER: | An exhaust cleaner on a diesel engine. |
| SECURE GROUND: | Make ground safe from falls e.g. scaling, bolting, timbering. |
| SHAFT SINKING: | Excavating a shaft downward, usually from the surface to gain access to an ore body. |
| SHEAR: | When structural pressures cause a plane to fracture, resulting in the shifting or displacing of one side of the plane in relation to the other side of the plane. |
| SHOTCRETING: | Pneumatically applied cement mortar, or shotcrete to prevent decay and provide support on surface of roofs and walls. |
| SISSOR TRUCK (LIFT): | A service vehicle used to lift people to another elevation of ground by using ground control and support methods. |

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| SILICOSIS: | A lung disorder caused by the inhalation of silica or quartz. |
| SILL: | The floor or bottom member of a timber set. Also, SILL refers to the floor of a seam or the bottom floor of a stope. |
| SINK: | The process or act of excavating a shaft or a slope. |
| SKIDS: | Planks, logs or beams along which heavy objects can be slid or moved. |
| SKIP: | Self -dumping type of conveyance in a shaft for hoisting ore/rock. |
| SKIP DUMP: | The top of the skip compartment in which ore is hoisted from the mine and dumped into ore/waste bin. |
| SKIP SCROLL: | The track at a skip dump which guides the skip to the dumping position. |
| SLASH: | The act of drilling and blasting ore from the sides of a passage or stope in order to make the opening wider. |
| SLIMES: | Extremely fine particles of rock suspended in water. |
| SLINGS: | Rigging or lifting device used to raise or lower objects. |
| SLUDGE: | The fine cuttings and water that come from a hole being drilled. |
| SLUSHER: | A multi drum device used in conjunction with a scraper to move broken rock. |
| SLUSHER BLOCK: | A pulley used in slusher operation. |
| SOUNDING: | Striking or tapping the back and walls of a workplace of a mine using the end of a scaling bar to check for loose rock. |
| SPACING: | A blasting term that refers to the distance between boreholes. |
| SPALLING: | The breaking off or flaking of thin layers of rock. SPALLING indicates that the stress levels in the rock are increasing. |

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| SPITTING: | The high-velocity ejection of small fragments of rock that occurs when a rock mass under stress breaks. Sometimes SPITTING is also called SPALLING. |
| SPOT: | The act of placing an object into position. e.g a car can be spotted under a chute so that the car can be loaded. |
| STAGING: | A working platform. |
| STATION OR SHAFT STATION: | An area of the shaft that has been enlarged so it can be used as a landing for the cage. All mining levels will have a landing. |
| STEMMING: | Clay, sand, slag, drill cuttings, gravel or water that is placed in a borehole to plug the hole and hold the explosive charge in place. Stemming might also be used to separate explosives within the length of a bore hole. |
| STENCH GAS: | A substance with a distinctive, disagreeable odour, similar to rotten eggs, put into the ventilation and compressed air systems to warn underground workers of fire or other emergencies. |
| STOCKPILE: | An accumulation or reserve pile of broken ore. |
| STOPE: | An excavation in a mine where ore is extracted. |
| STOPER: | A pneumatic drill with a telescopic leg primarily used in raise mining for drilling up holes and bolting the backs of drifts and stopes. |
| STRESS: | A load or force (mathematically calculated or measured) that is producing a strain on rock, wood, steel, backfill or other materials. |
| STRIKE ( of a bed): | The intersection of an inclined vein or seam with a horizontal plane. A STRIKE's direction is always at right angles to the tip. |
| STRINGER: | A narrow vein or veinlet of ore. Also, a STRINGER is a timber or beam connecting two upright timbers or posts. |
| STULLS: | Large timbers that have been wedged into place between two stope walls and serve as a platform or protective cover. |

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| SULPHIDE BLAST: | A Sulphide rock dust explosion caused by igniting the sulphide dust which is present in the workplace resulting in significant damage to mine openings. |
| SUMP: | A catch basin, usually at the bottom of a shaft but also found in other areas of the mine, where damage is collected and then pumped. |
| SWITCH BAR: | A component of a track switch throw which joins the points together. |
| TAILINGS: | The refuse, waste, sediment or tail product that has been left behind after an ore has been processed. |
| TEARING DOWN: | The dismantling of a rig or drilling equipment so that the area can be blasted or the equipment set up in another site. |
| TIMBER DOG: | A piece of steel used to hold two timbers together. |
| TIPPLE OPERATION: | The unloading of cars caused by sideways tipping. |
| TOE: | The bottom section or portion of a drill hole. |
| TRACK GAGE/GAUGE: | The measurement of the distance between the inner edges of railway rails. The term also refers to the diameter of drill bits. |
| TRAILING CABLE: | An electric cable extending from mobile equipment to power source. |
| TRAIN: | A connected string of cars that is usually powered by a motor. |
| TRAVEL WAY: | A passage for personnel ,equipment, muck and supplies in a mine. |
| TROLLEY OR TROLLEY LOCOMOTIVE: | A car that travels on a track or an electric haulage motor which receives its electricity from an overhead trolley wire. |
| TUGGER: | A small hoist used to move equipment and supplies. |
| TUNGSTEN CARBIDE: | A hard, highly abrasive material used in cutting edges of drill bits. |
| TURNTABLE: | A revolving platform used to turn mine cars and locomotives 180 degrees. |

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| UNDERCUT AND FILL MINING: | A mining method that involves creating a working floor with backfill following each production blast. |
| UPPER: | A hole drilled upwards to be blasted. |
| VEHICLE SISSOR LIFT TRACK: | A service vehicle used to elevate personnel and/or material to a desired location to work. |
| VEIN: | A rock fissure, crack or fracture that is filled with mineralized material. |
| VENTILATION: | Method of supplying respirable air to workplace in a mine and of exhausting contaminated air. |
| VENTILATION DUCTING OR TUBING: | Plastic or sheet-steel piping used to channel air to or from a working place. |
| VERTICAL CRATER RETREAT: | A bulk mining method that utilizes large diameter holes. Also referred to as Retreat Mining. In vertical crater retreat mining successive cuts are carried out remotely by blasting and cratering the bottom of the drill holes. The ore body is mined from the bottom up. |
| WALL PLATE: | The longest piece of timber in a set of shaft timbers which fit horizontally in a shaft. |
| WASTE: | 1. Rock that has no mineral value.<br>2. Refuse material. |
| WASTE PASS: | An opening to accommodate the movement of broken rock. |
| WAGON DRILL: | A light wagon, similar to a jumbo, that carries one or more mounted rock drills. |
| WEDGE: | A piece of wood or metal having two principal faces that met to form a sharp wedge. |
| WEDGE BLOCKS: | Rock that is bound by intersecting joint or fault planes and has a tendency to fall unless supported( by rockbolts, pillars or screen). |

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| WHEEL CHOCK: | Wedge shaped piece of material used to prevent mobile equipment from rolling. |
| WHIP CHECK: | Cables attached to hoses and equipment to retard backlash in the event of disconnection under pressure. |
| WINZE: | A shaft that is collared underground. |
| WIRE MESH: | A ground support mesh, screen or fencing that works with rockbolts to contain small pieces of rock, preventing them from falling in between the bolting pattern. WIRE MESH or screen acts as a stabilizing force when attached to a rock surface. |
| WORK OR WORKING: | The process of mining. Also refer to the shifting, moving or squeezing of rock. |
| WORKINGS: | Underground excavations from which ore is being extracted (or has been extracted). |

**AREAS OF COMPETENCY**

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# COMPETENCY ANALYSIS PROFILE
# BASIC UNDERGROUND HARD ROCK MINER - COMMON CORE
# ON-THE-JOB TRAINING STANDARDS

**⇐SKILLS⇒**

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| **FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES** **U0000** | Identify surface areas. U0000.1 | Identify underground areas. U0000.2 | Respond to surface and underground emergencies. U0000.3 | Apply company policies. U0000.4 | Comply with union contracts and joint health and safety policy. U0000.5 |
| | Operate communication systems. U0000.6 | Identify on-site explosive types and follow related handling procedures. U0000.7 | Review multichannel radio use in the presence of explosives. U0000.8 | | |
| **PERFORM GENERAL INSPECTIONS** **U0001** | Wear, adjust and maintain personal protective equipment. U0001.1 | Erect safety signs. U0001.2 | Operate fire extinguishers. U0001.3 | Maintain ventilation flow. U0001.4 | Operate hand and power tools. U0001.5 |
| | Lock out and/or tag mobile and fixed equipment. U0001.6 | Evacuate area in an emergency. U0001.7 | Identify and report water in chutes and hang ups. U0001.8 | Practice good housekeeping. U0001.9 | |
| **SCALE LOOSE ROCK** **U0002** | Identify and respond to loose and abnormal ground conditions. U0002.1 | Identify and respond to faulty ground support. U0002.2 | Identify and respond to workplace hazards. U0002.3 | Inspect and prepare rock for scaling. U0002.4 | Scale rock. U0002.5 |
| **SET UP WOODEN STAGING** **U0003** | Identify and respond to workplace hazards. U0003.1 | Inspect and prepare workplace for scaling. U0003.2 | Plan and organize work site. U0003.3 | Construct and erect wooden staging and ladders. U0003.4 | Tear down, move and store wooden staging. U0003.5 |

**AREAS OF COMPETENCY**

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**COMPETENCY ANALYSIS PROFILE**
**BASIC UNDERGROUND HARD ROCK MINER - COMMON CORE**
**ON-THE-JOB TRAINING STANDARDS**
**⇐SKILLS⇒**

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| **SET UP PRE-CONSTRUCTED STAGING** **U0003A** | Identify and respond to workplace hazards. U0003A.1 | Inspect and prepare workplace for scaling. U0003A.2 | Perform equipment pre-operational check on staging. U0003A.3 | Place and set-up pre-constructed staging. U0003A.4 | Erect standard ladders. U0003A.5 |
| | Tear down and store pre-constructed staging. U0003A.6 | Lock-out and/or tag fixed equipment. U0003A.7 | | | |
| **SET UP MECHANICAL STAGING** **U0003B** | Identify and respond to workplace hazards. U0003B.1 | Inspect and prepare workplace for scaling U0003B.2 | Perform equipment pre-operational check on mechanical staging. U0003B.3 | Operate mechanical staging. U0003B.4 | Perform shut down on mechanical staging. U0003B.5 |
| **DRILL ROCK** **U0004** | Identify and respond to workplace hazards. U0004.1 | Inspect and prepare rock face for scaling. U0004.2 | Bleed air and water lines. U0004.3 | Prepare face for drilling. U0004.4 | Set-up drills. U0004.5 |
| | Perform pre-operational check on stoper drill components. U0004.6 | Perform pre-operational check on jackleg drill components. U0004.7 | Perform pre-operational check on plugger drill components. U0004.8 | Maintain drills U0004.9 | Operate drill. U0004.10 |
| | Tear down drill U0004.11 | | | | |

**AREAS OF COMPETENCY**

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**COMPETENCY ANALYSIS PROFILE**
**BASIC UNDERGROUND HARD ROCK MINER- COMMON CORE**
**ON-THE-JOB TRAINING STANDARDS**
**←SKILLS→**

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| **ROCK BOLT GROUND** **U0005** | Identify and respond to workplace hazards. U0005.1 | Inspect and prepare rock face for scaling. U0005.2 | Bleed air and water lines. U0005.3 | Set up stoper and jackleg. U0005.4 | Perform pre-operational check on stoper drill components. U0005.5 |
| | Perform pre-operational check on jackleg drill components. U0005.6 | Maintain drill. U0005.7 | Operate drill. U0005.8 | Install rock bolts. U0005.9 | Tear down and store drill. U0005.10 |
| **BLAST ROCK** **U0006** | Identify and respond to workplace hazards. U0006.1 | Inspect and prepare workplace for scaling. U0006.2 | Select blasting detonators. U0006.3 | Transport explosives and detonators to work site. U0006.4 | Check and clean block holes. U0006.5 |
| | Select and operate explosive loading devices. U0006.6 | Load hole. U0006.7 | Sandblast oversize muck. U0006.8 | Reblast mishole. U0006.9 | Tear down, move and store explosives and loading equipment. U0006.10 |
| | Guard area and prepare blast. U0006.11 | Report blast. U0006.12 | | | |

**AREAS OF COMPETENCY**

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**COMPETENCY ANALYSIS PROFILE**
**BASIC UNDERGROUND HARD ROCK MINER- COMMON CORE**
**ON-THE-JOB TRAINING STANDARDS**
**←SKILLS→**

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| **MUCK WITH SLUSHER** **U0008** | Identify and respond to workplace hazards. U0008.1 | Inspect and prepare workplace for scaling. U0008.2 | Perform pre-operational check on slusher. U0008.3 | Set up and operate slusher. U0008.4 | Wash down work area. U0008.5 |
| | Manage muck pile. U0008.6 | Shut down slusher. U0008.7 | Handle explosives and dispose of foreign material. U0008.8 | | |
| **MUCK WITH MUCKING MACHINE** **U0009** | Identify and respond to workplace hazards. U0009.1 | Inspect and prepare workplace for scaling. U0009.2 | Perform equipment pre-operational checks on mucking machine. U0009.3 | Set up and operate mucking machine. U0009.4 | Wash down work area. U0009.5 |
| | Manage muck pile. U0009.6 | Shut down mucking machine. U0009.7 | Handle explosives and dispose of foreign material. U0009.8 | | |
| **MUCK WITH LOAD HAUL DUMP MACHINE** **U0010** | Identify and respond to workplace hazards. U0010.1 | Inspect and prepare workplace for scaling. U0010.2 | Perform equipment pre-operational check on load haul dump machine. U0010.3 | Set up and operate load haul dump machine. U0010.4 | Conduct operational checks on load haul dump machine. U0010.5 |
| | Load muck. U0010.6 | Haul muck. U0010.7 | Dump muck. U0010.8 | Park and shut down load haul dump machine. U0010.9 | |